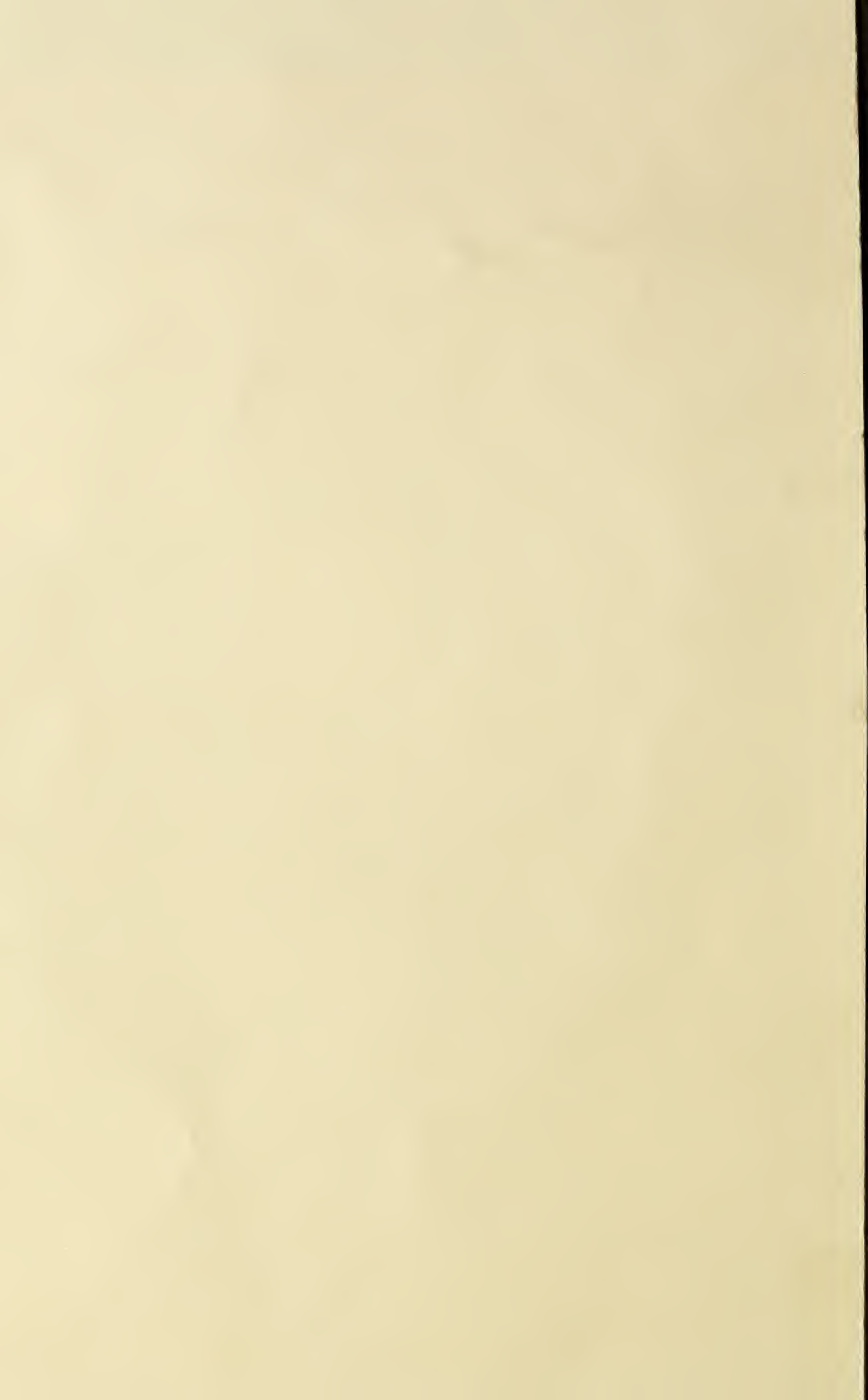


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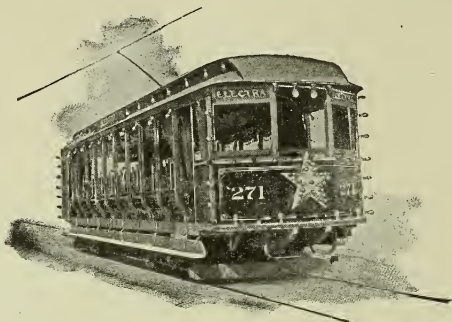
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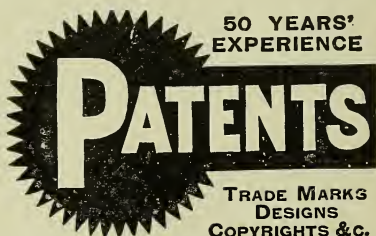
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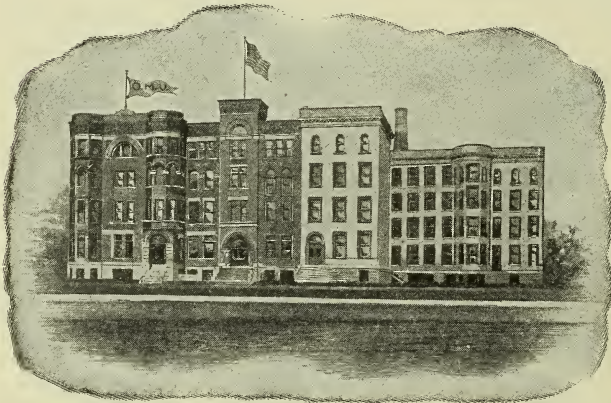
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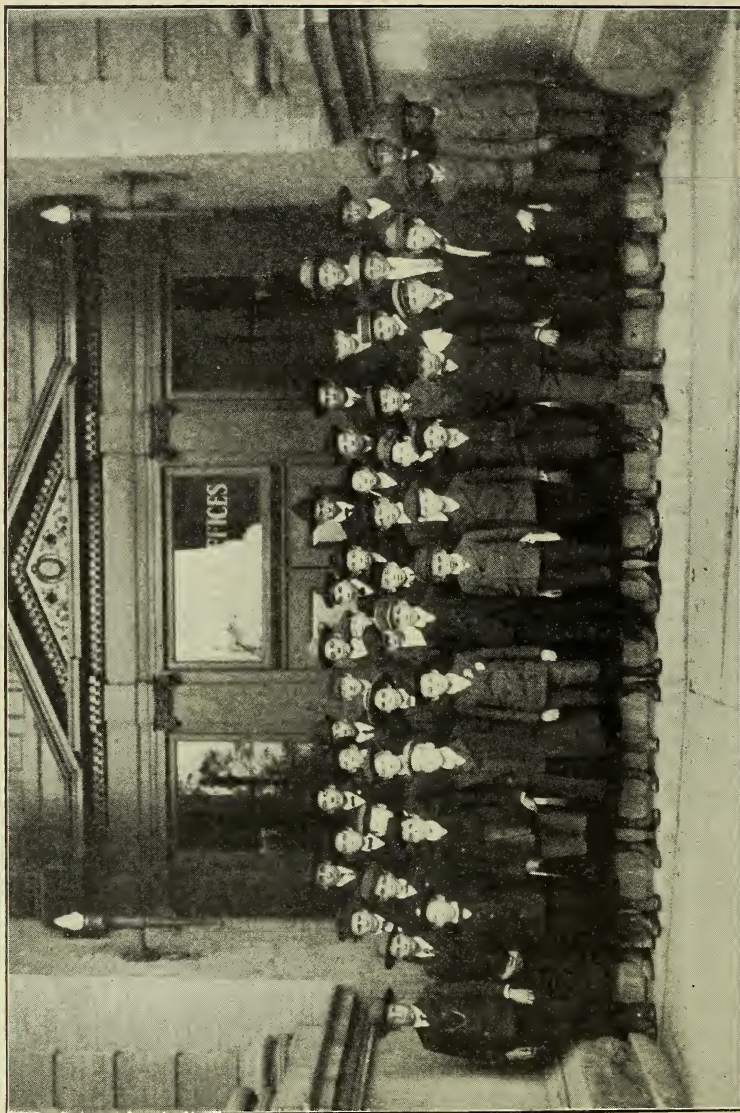
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MEETING OF SPRINGFIELD TOWNSHIP AGRICULTURAL CLUB.

See A. B. Graham's Article, page 75.

THE AGRICULTURAL STUDENT.

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OHIO STATE UNIVERSITY, COLUMBUS, JANUARY, 1905

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EDITORIAL CHAT.

A recent writing says, "The future resembles a foggy morning, for, as we gaze afar we can discern nothing, but as we approach, the outlines of objects becomes dimly visible, until at last all things become distinct."

This is indeed true of our future, for we may hope and wish for things, but can never be sure of them until in actual participation of them. Everyone should endeavor to make the most of his opportunities, be they great or small. It has been truly said that everyone has his future in his own hands and it rests with him as to what he will make it. It should be the desire of every true young person to make the best of everything within him, thus bringing honor to himself and to his fellowmen. At an early age one should begin to consider his future occupation. If you have a decided talent for some special branch of study cultivate it by all means, but let me beg of you not to neglect everything else and devote yourself entirely to this one thing, as it has been said: "It is better for a person to have a small knowledge of a good many things than to be a genius in one and uncultured in all the rest."

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It seems to me that this theme has a direct bearing upon our present system of education, which in many instances tends towards specialization and technical application. Nevertheless, we should not allow specialization to enter to the extent of narrowness. A special knowledge of a certain subject may be a great benefit for a short time, but if we are to broaden our lives and fill the sphere in which each of us move, we must have as a basis of our operations a broad, comprehensive knowledge of many things upon which we can readily draw in an emergency. This is the sphere of the college man and to completely fill it he must reach out from a single narrow track and gain a general knowledge of all the principles upon which the theories of this life are based.

The Extension of Agricultural Education.

The development of agriculture and of agricultural education has merely begun. The few years in which our colleges and experiment stations have existed have served to point out a few facts, to demonstrate in a measure something of the possibilities inherent in this movement which is doubtless destined to revolutionize our agricultural methods. A great deal has already been accomplished, but when compared with that which is to follow, it is doubtless very insignificant. Our colleges have been thus far simply developing methods and groping after means of applying the facts already definitely known. However, this development has not been slow and the various subjects are rapidly assuming a pedagogical form, so that the next decade will doubtless witness the science of agriculture placed on an equal footing with the older sciences in our leading land grant colleges. It has already assumed a position akin to this in some of the

more important institutions, and it is exceedingly gratifying to those interested in its development to note the sentiment that is thus arising.

Great credit is due to the men who have been most instrumental in the development of the work thus far undertaken, and their efforts have been most commendable, but nevertheless there are yet certain notable lacks in the system. One of the most important of these is the failure to formulate plans which will effectively meet the requirements for agricultural instruction demanded by the farmer and the farmer's children. Some institutions have taken up this work and are pursuing methods more or less effective, but in most of these the plans are merely experimental, while the larger number are still unappreciative of the fact that there is any real demand for this work. Probably this is as should be expected, but it is undoubtedly time that our agricultural educators were giving attention to a more widespread dissemination of their teachings and to the development of a thorough appreciation of the importance of agriculture among the young of our rural communities. It would seem that our responsibility as educators should be measured, not by the half-hundred young men of each state who each year present themselves to the agricultural college, but rather by the thousands of farmers, young and old, who will never have the opportunity of attending such schools. The training of these young men at the college is doubtless very important, probably most important, but the obligations to those at home cannot be ignored and our full duty will not be done until some practical means of reaching them has been found. The development of efficient courses in our colleges must not be neglected, but it would seem that

many institutions are forgetting almost entirely the masses of agricultural workers in their zeal to give the best training possible to the students in the college.

The means by which this dissemination of agricultural ideas is to be brought about is the important thing to be considered. Doubtless methods adapted to our state will be only partially suited to another, and it will require judgment and experience on the part of those in charge of the work to find the plan most applicable to conditions, but this fact only emphasizes the importance of beginning the work at once. A beginning should be made, an effort put forth to find the proper means of bringing modern agricultural teachings and discoveries before the people.

The training of the young in our rural schools probably offers most for the future. It is not a matter of teaching them agriculture, but rather the development within the young of a respect and reverence for agriculture as a vocation, and an appreciation of the possibilities for thorough living and success that this oldest of sciences holds for the person who will give it attention. It is the development within the child's mind of a proper view point of the whole matter, and the kindling of an interest in nature and rural things. The whole trouble thus far has been that the teaching has been of such a nature that the child was drawn from the country rather than toward it, and until this is changed we cannot expect our greatest agricultural advancement. Undoubtedly the training of teachers is one of the first requirements and the matter is deserving of immediate attention. No more important or more potent factor could exist in furthering agricultural development than a properly trained corps

of teachers in our primary and secondary schools.

The duty of our agricultural colleges to the mass of practical farmers is another matter which demands attention. Doubtless the forces which are being set in operation in our colleges and the effect of proper training in our primary and secondary schools will produce far-reaching results, but the demands of our present day farmers for information should not be ignored. This particular feature of extension work has received more attention than others, especially in some states, but the fact still remains that the body of our agriculturists are today but very slightly influenced by the work of our colleges and stations. It is therefore of great importance that methods be adopted which shall place the agricultural colleges in direct touch with our farmers in every community. Short courses at the college, reading clubs, correspondence courses, traveling libraries, all are being tried with greater or less success in various states, but it yet remains for most of our colleges to formulate plans whereby this work shall be developed with efficiency. It is to be hoped that the day is not far distant when the needs for a widespread extension of agricultural teaching shall be appreciated by our agricultural educators in every state and when every effort shall be made for the development of the most practical systems possible.

M. F. MILLER.

The Club Meeting.

It is very necessary that a particular time be arranged for to take up subjects in elementary agriculture either at a school house or the home of a teacher. This time may be very profitably given to exchanging opinions and relating experiences in carrying on the work of testing at home.

Here the future farmers of the township are found not only becoming acquainted with one another, but acquiring the habit of thoughtful investigation, and of making records which are necessary to arrive at definite conclusions. Each boy is quite anxious to learn about soil conditions in different parts of the township; he enjoys learning to know what plants or birds are found in greater numbers in one part than in another; he fears the coming of insect pests he has here learned about. In other words, he has begun to study his township or vicinity as he will no doubt some day study larger territories.

One of the most portentous and interesting features of the club meeting is that little crowds gather here and there discussing some subject relating to the club's work before and after the meetings are called to order.

The club serves a further purpose of interesting fathers and mothers in making of the farm life one of dignity. They are finding from month to month that their work is being elevated to the plane of a science, receiving the attention of the most careful scientists; they come bringing the son whom they hope will form a more favorable opinion of the father's work.

Not infrequently parents have remained at the meeting from which they usually carry some fact or process which may prove valuable to them. Their experiences are many times valuable. Their conclusions are quite often true, but not always so because they have not been arrived at from a knowledge of real causes.

Club work gives the boys in early life a wider range of physical causes to which to assign reasons for certain results. They are here preparing for the

work in the natural sciences in the high school.

Prior to the day of meeting, a sheet suggesting certain chapters or parts of chapters to read is sent to each boy. For our last meeting the boys were asked to read such parts of Agriculture for Beginners, First Principles of Agriculture, and Life on the Farm as pertained to soils and how the plant secures its food from both the air and soil.

At the club meeting on Saturday afternoon, this work was gone over carefully. A small blackboard on which to make illustration, diagrams, summaries, etc., is quite a helpful thing to have. A small bottle of ammonia represented the nitrogenous plant foods; the bottle was passed and smelled cautiously. Every boy recalled having come in contact with such an odor before. Means for preventing its rapid evaporation from manures was briefly taken up. Nitrate of potash was passed around and tasted by each. Phosphorous in its commonest form was simply referred to. All this work was done to establish type forms of the three great soil plant foods.

Near the close of the meeting a very interesting exercise in rope splicing was taken up. Several boys were furnished with pieces of rope and shown how to make the splice.

Several interesting exercises not directly related to the subject considered can be used to increase the interest in the meeting. Bulletin No. 1, published by the Agricultural College of Minnesota, St. Anthony Park, Minn., is full of suggestion.

Why should not the club meetings be the forerunner of the Elementary Country Agricultural School such as Wisconsin already has?

A. B. GRAHAM.

Judging Contest at the International.

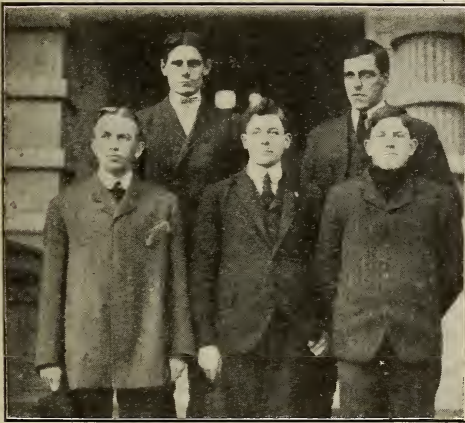
To Prof. Chas. S. Plumb, O. S. U., Columbus, O.:

Congratulations to you and the boys on winning cattle, hog and sheep trophy, and tie for fourth place with Texas for horse trophy. Martin wins first money, Griffin third.

W. E. SKINNER.

The above is a copy of the telegram which caused every heart in the Agricultural College to beat with pride and joy, and why not?

At the first judging contest at Chicago the achievements of the team rep-



W. A. Martin

J. V. Hyatt

F. L. West

B. Griffin

F. L. Allen

THE JUDGING TEAM.

resenting the Ohio State University were not of sufficient moment to receive notice. Owing to the standing made by that team it was deemed best not to be represented in the second contest. The work of last year's team is still fresh in the minds of the student body. By the taking of second place last year, Ohio State was brought be-

fore the agricultural world as if by magic, and the results of this year's work conclusively proves that the institution is no longer one to be left unnoticed, but one which must be taken into account and which is a formidable rival for any of our sister colleges.

The casual reader may think that we are growing boastful, but let us say, that in thus rejoicing over a well-earned victory (which is a most logical thing to do when the banner of victory waves proudly above our camp), we are not necessarily boasting. Although rejoicing as we do, we are not blind to the fact that the position just attained is one not easy to hold, but we can and will hold it if each student is alive to the best interests of the Scarlet and Gray and is willing to give his time to hard, conscientious work.

The contest was free from many of the unpleasant and harassing features which have characterized other contests. Owing to the dissatisfaction so prevalent last year, the authorities did all in their power to give to each contestant his rightful place.

The ring at all times was kept free of all persons except the contestants and officials. Some notable features, however, caused a little dissatisfaction, as the judging of a ring of Red Polls strictly from beef instead of bred type, and one ring of bacon hogs being judged as heavy fat hogs. With these exceptions the contest was very satisfactory, in fact, by far the most satisfactory in the history of the contests at the International.

Besides the prizes mentioned in the telegram, Martin first and Griffin third, Allen tied for sixth.

Taking everything into account, we ought to be proud of the showing made, and why should we not have made the campus ring with hearty cheers when the news was received.

Such tidings should stir each and every one of us to a prolonged "Hurrah for Ohio State."

The Relation of the Agricultural College to Practical Agriculture.

About a half century ago there arose in the United States Congress a very stormy debate. It was occasioned by the introduction of a bill which was the beginning of the movement out of which grew our land-grant colleges.

The bill was received with little showing of enthusiasm, and after being referred to the Committee on Public Lands and reported back to the House unfavorably, it was passed by the House, April 28, 1858, by a vote of 105 to 100.

Hon Justin S. Morrill, sponsor for the bill, was disappointed in having the bill referred to the Committee on Public Lands rather than to that on Agriculture, since it was in fact an appeal for aid in bettering the agricultural interests of the country. In his argument in support of the bill, he presented statistics showing that the conditions of agriculture in many regions were growing less favorable and that the products of the soil were decreasing to such a degree as to endanger the perpetual prosperity of this great industry. The decrease in the number of animals and the somewhat widespread discouragement in the older states led him to make a strong plea for such provision as

would eventually prevent the exhaustion of the soil and maintain the permanent prosperity of the farmer. It was his claim that the measure was "no less of public good than of public justice—just politically, just to all the states, and just, above all, to the manhood of our country."

During his speech he showed how the government expended millions to protect and promote commerce, through lighthouses, coast surveys, and improvement of harbors; how the military "crown jewels" were manufactured at West Point; how immense grants of land were made to railroads to open new fields of internal trade; how literary labor was given protection by copyright, and how high profits were secured to ingenious mechanics by patent rights; and, then, how all public encouragement to agriculture had been rigidly withheld.

He showed the importance of agriculture and in fact exhibited an accurate and comprehensive grasp of the problems that are today being wrought out in these colleges. The whole trend of the argument was to the effect that the education of the country was incomplete, and that some such provision as was made in this bill was necessary in order to give opportunity to all classes of our people.

In the Senate the bill met with vigorous opposition. The varied objections heralded against it were that it was unconstitutional, that it was against public policy, that its effects were uneven and therefore to that degree unjust. Senator Mason of Virginia designated it as "one of the most extravagant engines of mischief under the

guise of gratuitous donation that could originate in the Senate."

It was alleged further that the honest tillers of the soil did not desire the passage of the bill and that the ultimate result would be to lead men into other pursuits in life rather than into agriculture.

Notwithstanding this vigorous debate the bill was passed in the Senate, by a vote of 25 to 22, on the 7th of February, 1859. On the 26th of that month President Buchanan sent his veto to the House.

Mr. Morrill immediately attempted to have the bill passed over the President's veto, but failed by a vote of 105 to 96. In the remarks submitted at that time Mr. Morrill very briefly but clearly denied the partisan character of the bill; submitted that it had the support of the agricultural interests throughout the whole country, and, as it now seems, met fairly and squarely every objection of the President.

The death of the bill by veto, however, did not defeat the cause, and on December 16, 1861, Mr. Morrill introduced the measure again, and again it was reported back unfavorably. In the following June Mr. Morrill attempted to offer a substitute for the bill, but in the meantime on May 5th, Senator Wade, of Ohio, introduced the same measure in the Senate. The bill passed through a series of debates and finally, on June 10, passed the Senate by a vote of 32 to 7. On June 17th the bill was taken up in the House by Mr. Morrill and passed by a vote of 90 to 25. The bill was signed by President Lincoln, July 1, reported to the House, July 2, and thus became a law.

Its passage was due to the more or less clearness of vision with which a few farsighted statesmen looked into the future and saw the rising demand for a system of education better adapted to the needs of the times, which should go beyond the requirements for classics, law, medicine, divinity and letters; an education which, without proscribing or neglecting classical and philosophical studies, should utilize for the public good the known and discoverable laws and processes of nature for the increase of production and the multiplication of the comforts and necessities of life. This demand the Morrill law was intended to satisfy, and upon this foundation more than fifty state colleges and universities are established.

Let us pause for a moment and ask ourselves whether our agricultural colleges are actually carrying out the principles that were voiced by the Morrill act, and whether they are really aiding the practical agriculture of the country.

The old institutions looked doubtfully and not quite sympathetically on the new education. They gravely shook their heads at the credulity of those who thought that investigation in those branches of science relating to agriculture could be carried beyond the merest rudiments or would be productive of results at all commensurate with the expenditure of the time and money proposed. When they saw, however, that the foundations of a science of agriculture were being laid in extended courses of botany, comparative anatomy, physiology, biology, chemistry, entomology—that, through these, barren fields were made fertile, the products of animal and vegetable industry improved in quality, multiplied in quan-

tity, and increased many fold in commercial value—the exclusiveness of the old tacitly acquired in a modified recognition of the new. Silently, steadily, resistlessly the new has moved on regardless of the contempt, the pity, the tolerance of the old. Ere long the new institutions, retaining for the most part the classics and philosophies of the old, established chemical, physical, and biological laboratories on a scale of expenditure and completeness far beyond the resources of the old; they set the pace for scientific study and investigation in America. By their bold experiments and stupendous results they startled the old institutions out of their complacent lethargy and roused them to an activity hitherto unknown. They have made it manifest that the classical and philosophical attainments and discipline could exist side by side with thorough training and far-reaching acquirements in natural science, and that these latter found an application in the development of agriculture out of all proportion to the original conception on which the legislation of 1862 was based. They have done much to dignify industrial education, and have emphasized in a practical way what many people have held as a theory, namely, that industry is our great national virtue.

I realize that there are here and there throughout our land those who think that the agricultural college has no place in the workings of our nation and that agriculture is surely on the decline. However, the views of the most pessimistic of these might be considerably changed if he could have taken a glimpse into the Palace of Agriculture at the World's Fair, and realize that what he saw there was in large measure the product of the agricultural college. The total impression of this

building was not that it was the work of farmers who plow and pluck and reap and produce each his own little share; but you feel rather that we have come into that era of development where men have discovered the inexhaustible richness of the earth; where they use it as a laboratory, varying and improving its yield at will, and they sow and harvest by such a complete adaptation of machinery that farming has become almost a sedentary occupation, where science has been so applied to the use of what was once waste articles that a farmer has become also a manufacturer of a great variety of products.

It has been alleged by some of our prominent agricultural writers that the agricultural college is not benefiting the practical agriculture of the country because it is not turning out all of its graduates as farmers. It appears to me that these persons are rather shortsighted; they have not attempted to look beyond their own very limited sphere.

It is true in our own college that only about one-third of the graduates do go to the farm and engage in practical work, but the other two-thirds have, with few exceptions, gone to fill positions in experiment stations, agricultural colleges, and government work, where they can no doubt do more at the present time for the practical agriculture of the country than they could hope to do by engaging in actual farming. The future no doubt with its ever-increasing number of graduates will more than supply the demand for the professional agriculturist and more and more the number returning to the farm will be increased.

Whatever course we may pursue we must not lose sight of the fact that there are hundreds of problems to which educated men and women must address

themselves if the permanent prosperity of the world is to be preserved.

Agriculture lies at the basis not only of our wealth, but of much of our enjoyment. It is to the men and women who have the training for which our agricultural colleges stand that we shall look in the future for preserving and enlarging those phases of life ministered to by the material advances of the world. We must look to these men and women to hand the world to succeeding generations as a precious heritage rather than a wasted and wornout patrimony.

J. C. WHITE.

A Defense of Ohio Agriculture.

Paper read by H. C. Ramsower before the O. S. U. Agricultural Society.

I imagine that on the announcement of such a subject the thought ran through many of your minds as to why and in what way Ohio agriculture needs defense, and I confess that I, too, was stirred with similar thoughts when the question was brought to mind. But there always have been, are, and always will be men in every walk of life who, through some misfortune due generally to no one's fault but their own, have become dissatisfied with their vocation and can see nothing but disaster and ruin ahead not only for themselves but for all engaged in like work. To this agriculture affords no exception and from time to time published in our most prominent agricultural journals and signed by men whose opinions cannot be lightly set aside, we see articles which, though the intentions of the writers may have been honest and sincere, nevertheless create a feeling of unrest among those of the younger generations leading oftentimes to disastrous results.

During the past few months several such articles have come to our atten-

tion and the seriousness with which they were written, the prominence of their authors, but above all the reasons advanced lead us to give the question some thought, to investigate, and, if possible, to disprove the grounds upon which they based their claims.

Throughout each and every article written by these men one thing was strikingly evident—they were so pessimistically narrow in their views that they failed to comprehend *all* that is connected with the advancement, with the onward march of agriculture toward that goal of perfection of rural life which our state is earnestly striving to attain. Many of them put their finger upon one little spot in one of the various lines of agriculture and say that since this spot is growing yellow and moldy from inability to advance the whole state is doing the same. Says one writer with all the confidence that only ignorance can give a man, "What commercial enterprise can claim prosperity while its deposits are surely diminishing? Not until it is shown that these hills of Southern Ohio are producing more than their virgin fertility or that the brains have all gone into other vocations will I believe that Ohio agriculture is even holding its own."

This writer insinuates two things: (1) That the annual crop production is slowly decreasing; (2) that the fertility of the soil is being exhausted. As to the crop production anyone who makes such claims fails to consult reliable sources of information or manufactures his own statistics, most probably the latter. While census reports and government bulletins are not infallible yet in the main they are correct and the only means of ascertaining where we stand. We realize that figures are often burdensome and confusing and will not inflict many upon you, but investigation

has proven to us that during a period of years from 1860 to 1900 Ohio has increased her total production of corn twelve fold, has tripled her bushels of wheat and the same with oats. But you say that in the meantime the acreage was being constantly increased, which would necessitate a greater annual yield. Glance at the following table which shows the average yield per acre for the years specified:

	1879	'89	'99
Corn	34.1 bu.	35.7 bu.	39.7 bu.
Wheat ...	18 bu.	15.7 bu.	15.7 bu.
Oats	31.5 bu.	33 bu.	37.7 bu.

With the exception of wheat these figures show a decided increase in acreage yield.

1850-'76 the average yield per acre of wheat was..... 11.64 bu.

1877-1903 the average yield per acre of wheat was..... 14.26 bu.

1850-'76 the average yield per acre of corn was..... 33 bu.

1877-'04 the average yield per acre of corn was..... 33.17 bu

These figures argue not only that we are progressing in cereal production, but also that our land is not as the pessimist would have us believe, on the way to inevitable exhaustion, but that we are at least holding our own. It is not our purpose to attempt the defense of anything that does not honestly deserve it and we cannot deny that our system of cultivation has been exhaustive to an extent which ought not to be. But, thanks to the agricultural educator, the error was made evident and the last twenty-five years has proven that after years of continuous cultivation with exhausting crops it is possible to restore the soil to its virgin fertility, nay, even better, soil which, in its natural state, was incapable of producing a crop can be made to yield a fair return for labor and money expended.

What do such labors, what do such investigations mean? Do they not argue advancement which, though not viewed as such by all, is more truly advancement than if we were pointed the road to fortune?

As to Ohio's livestock little need be said. It needs no defense from us. Here is how we rank in comparison with other states:

	In Number	In Value
Horses	Fifth	Third
Cows	Seventh	Fifth
Cattle	Tenth	Eighth
Sheep	Fifth	Third
Swine	Fifth	Fourth

Thus it is seen that, with the single exception of swine, we stand two places higher in the valuation of our live stock than in numbers.

In a recent issue of the Ohio Farmer Mr. Geo. E. Scott says that other states have fallen into line and climbed the ladder of fame while we slept. We would feel deeply grateful to Mr. Scott if he would be more explicit and tell us when Ohio has slept, what other states have passed us on that ladder of fame, and in what they have made themselves famous. Ohio does not claim to be a specialist. Other states may surpass us in special work. California is our superior in the production of fruit. Illinois perhaps in corn. Wisconsin boasts of greater dairy interests; other states have more cattle, but Oklahoma is the only state of a size equal to Ohio which beats us in number, and even her we exceed in valuation of their live stock one million dollars. Some of the western states have been more richly endowed by nature in mineral wealth. Manufacturing establishments are more abundant and extensive in some of the eastern states, but nowhere in all the Union can a more varied line of agricultural industries be found in which every department is in

a growing and prosperous condition, and ranks in quality if not in quantity with those states which are specialists in their particular lines.

The intellectual and moral progress of our rural communities cannot be passed without mention. In this we do not need to take the opinions of others, for who of us does not swell with pride as he notes the progress being made in his home community. Farmers are no longer satisfied with a mere existence for themselves and families, but education has so raised their standard of living that their beautiful homes, sleek stock, and happy families justly entitle them to the respect which they now command. And fellow members of this Society, let us remember that in placing our names upon the roll of this institution we assume a responsibility from which we must not shrink. Pessimists there are and will be, yet it is not for us to turn spurningly away but rather from that higher plane to which education is meant to raise us, seek to show them the error of their ways.

Choosing the Future Brood Sow.

BY F. L. WEST.

It is quite evident to anyone who has spent much time on the farm that of the large number of brood sows kept on any farm, it is a comparatively small proportion which changes hands, and that a relative large percentage are chosen from the litters of pigs annually raised on that farm. Every year some of the old sows are fed and their places thus taken by these younger ones.

Because of the selection of our brood sows from our own piggeries it is possible to accomplish wonderful results if only we bear in mind a few points in our selection. These points in order of

merit are, growthiness, uniformity, and stamina. In every litter of pigs there are some that from the very beginning push forward with greater rapidity than others. This is in a large measure due to their ability to look out for themselves, and will result later in their taking possession of the very best quarters in the feeding pen, which will be of considerable advantage to them during the period of their growth, and later, while suckling their litters. It has often been urged, and truly, too, that the rapid growing pig has a tendency to coarseness, but as a rule this tendency is more than offset by the increased vigor, of such animals, and vigor is one of the essential points often lacking in breeding animals. It is a fact, which has often been proven, that in the corn belt there is an offsetting tendency whereby hogs are apt to become too refined. So only by selecting the most vigorous, growthy animals can we keep up the desired size. Besides if a young sow is a good eater she generally not only shows rapid growth, but carries heavy flesh as well, and this is what is desired in regions where the fat hog is raised, as against the regions raising the bacon hog.

Next after growthiness and vigor I would place uniformity in shape, size, color and general conformation. Look to it that your young sows have plenty of bone to support their heavy flesh, and pay particular attention to the strength of the pasterns, that is as to whether they stand up squarely on their feet. This may seem at first a minor detail, but a more careful survey will show its importance. In the corn belt where many hogs are fattened anything indicative of weakness either before or behind should be regarded as a fatal defect and such an animal should be excluded from the herd.

Another point not to be lost sight of is the size of litter. This characteristic is undoubtedly inherited, and a sow from a large litter is more likely to be prolific than one from a small litter. By careful selection along this line, there is no doubt in my mind but that the number of pigs in the litter may be increased and fixed.

Be on the lookout for stamina as indicated by the bone development and heart girth. Do not breed your hogs too refined as they are likely to be more susceptible to disease. Some persons look to the thickness of ear as an indicator of stamina, and a reasonable degree of thickness is not undesirable, but be careful as this is a delicate point, and an ear a trifle too thick surely becomes indicative of coarseness as well. For my part I would prefer a little touch of masculinity in the ear and nose of a sow to an over degree of refinement. These are the points that I consider of value in selection of brood sows.

An Opportunity.

A few years ago the great tide of civilization in the United States was toward the West, but now there is beginning to be a change and many farmers in the West are turning to the East, recognizing the greater possibilities there for the up-to-date farmer.

Although this country is the oldest, there are parts of it still undeveloped and it presents a broad field for improvement.

In Virginia, which has been called "The Cradle of America," the agriculture has advanced very little since the Civil War. The country around old Jamestown and Yorktown, which was the scene of the early development of this country and of so much conflict which saw the "survival of the fittest" in the seventeenth century, is now al-

most a wilderness. About two-thirds of the country is in forests of pines with a few deciduous trees, and each year sees more growing up. In many of the thickets the old furrows can be seen, showing that it had been cultivated only a few years ago. What is the cause of all this? The chief cause was the Civil War. During that great struggle fortunes were lost and plantations laid waste, leaving the whole country destitute. The negro who, under the direction of the white man, tilled the soil, became after the war a worthless individual and a great encumbrance to agricultural advancement.

Being left with plenty of land and no capital or labor to work it, the Virginia planter allowed most of his land to grow up and only cultivated small patches that he could tend himself. He sold land to the negroes, and now almost every negro has a little patch of ground with a cabin on it. As their standard of living is very low they can live without much work, doing a great deal of fishing and hunting.

The lack of help is probably the greatest drawback at the present day. Farmers will put in a crop and then lose it because they can get no help to tend and harvest it.

The methods of agriculture have changed very little in the last fifty years. Oxen are used mostly for all farm work and hauling, and everybody is content to let things go along in "the same old way." The soils vary from sand to clay and are well adapted to general farming, with the exception that they are lacking in organic matter. When this is supplied they produce good crops. Many northern and western farmers have located in this country and are making a great success.

The southern farmer has not yet learned to work to advantage. To illus-

trate, in harvesting corn he first goes over the field and pulls all the blades and ties them in bundles; then the tops are cut and shocked. After the ears have ripened they are jerked and hauled to the barn where they are husked by negro women and children. Then before the land can be sown the stalks are cut down with a sharp hoe. A northern farmer does all this by going over the field once. Of course, there is some advantage in this method as they save more of the fodder. They use the blades in the place of hay, as very little hay is grown, but what is gained does not compensate for the loss in time and labor.

It is the same with all farm work. A man with the improved machinery of the North and West and a little energy could transform that country into a garden.

It presents an opportunity to the young man who has some money to invest and wants to make a home for himself. The land with the timber on it sells from \$5 to \$10 per acre.

This is only a very small part of the South and East that is awaiting improvement. This country is to be in the future what the West has been in the past and the possibilities are great. It is no longer. "Young man, go West," but "Go South and East and apply the knowledge gained in the West."

Cassava.

By Leland E. Call.

The disastrous frosts in Florida in 1894 mark a period of change in the agriculture of that state. Before that time most of the agricultural activity had been devoted to the production of oranges, but with the wholesale destruction of the orange orchards the farmers naturally looked toward the production of more certain products.

Many turned their attention to the production of live stock, but not being able to successfully grow corn they were naturally in need of a good carbonaceous food; this was found in cassava.

Cassava is a native of Brazil and comprises two distinct species, the sweet and the sour, differing chiefly in that the sourer cassava contains a poisonous juice analogous to hydrocyanic acid; this poison is, however, easily dispersed by heat, making the product a valuable food. The plants grow in a bushy form usually six to eight feet high. The branches fork repeatedly, are brittle and contain a large white pith. The leaves are on slender petioles which are from six to twelve inches in length, the blade being deeply palmately divided into from three to eleven divisions which are oblanceolate in form. They are bright green in color, very smooth, and have the waxy appearance common to tropical foliage. The flowers are in a loose spreading cluster near the end of the branch, their diameter when open is about three-eighths of an inch and varies in color from greenish purple to light greenish blue. The root, which is the part of the plant useful as food, grows in clusters, and the size of one season's growth is about one and one-half to two and one-half inches in diameter and one and one-half to four feet long, commonly weighing five to ten pounds. The color of the root is usually red or brown, though often white.

Bitter cassava is most commonly grown in the tropics and produces more roots than sweet cassava, though it requires a longer time to grow, not reaching maturity under six years. It is from the pure flour of the bitter cassava that our food product tapioca is made. This is separated from the fibrous part

of the root by taking a small quantity of the pulp after the juice has been extracted and working it in the hand till a thick white cream appears on the surface, this being scraped off and washed in water gradually subsides to the bottom. After the water is poured off the remaining moisture is dissipated by a slow fire, the substance being constantly stirred until it forms into small grains.

Only three or four varieties of sweet cassava are grown in this country, although forty or fifty are cultivated in Brazil. It is grown in Florida and the other gulf states as far west as Louisiana and as far north as Atlanta and Memphis. A native of the tropics, its growth is stopped by light frosts or continued cold weather, and can be cultivated only in localities free from frost for at least eight months of the year.

The best soil for its growth is a light, rich sandy loam and many growers prefer the soil to be underlaid by a hardpan which prevents the roots from growing deep, and thus makes them easier to pull when they are harvested. The soil should be dry rather than wet and the plant will do well on soils too dry for corn; the crop never fails for want of rain, although abundant moisture is needed to induce the seed cones to sprout. Soils which are exceptionally rich in humus produces an excessive growth of tops with small and watery roots. Like most crops it requires a reasonable amount of fertility in the soil to produce good results, and the use of commercial fertilizers have materially increased its yield.

The crop is not grown from seeds but from cones or stalks grown in previous seasons and kept buried during the winter. In planting the cones are dropped and covered as Irish potatoes, the covering being from two to four inches in

depth, depending on the lightness of the soil. Little cultivation is necessary except to keep the ground smooth and to keep out weeds. At all times the cultivation should be shallow as the roots should come close to the top of the ground.

The harvesting of the roots usually begins about November first and continues to the first of February. Sometimes the roots are not dug the first season, but allowed to grow a second year, and in this case they make an enormous size, but become hard and woody and are not of so much value. The roots are hard to keep and are seldom dug over a week in advance of the time to be used, although with just the right temperature they may be kept for several months.

Cassava yields from two to seven tons per acre, although as high as fifteen tons per acre have been grown. Fully ninety-five per cent. of the cassava grown in this country is now fed to live stock. It is fed to horses, cattle, hogs and poultry. It is often fed with bran, shorts, cottonseed meal or other nitrogenous food and when properly fed is one of the cheapest foods that can be grown. Less watery and produces a larger yield than roots and much more nutritious than silage, and when the roots are fed as fast as dry are always in good condition.

Cassava is fed to cattle more than any other stock. For milch cows it stimulates the flow of milk, gives a rich color, but no distinct flavor as silage or some roots. It also increases the supply of butter which it makes harder and firmer. Due to the very large per cent. of starch it is an excellent food for fattening cattle, as it is also fresh and succulent, and gives best results when fed with velvet beans or prairie hay. It is also extensively used in feeding hogs

where the crop is sometimes gathered by turning the swine in the field, but more economically fed when pulled and given to the hogs in the pen. While it is too carbonaceous for growing pigs it is sometimes fed exclusively to them in the fattening stage.

Five per cent. of the cassava crop is used in the manufacture of starch. In this industry only twenty per cent. of the twenty-four to twenty-eight per cent. of starch in the plant is secured, leaving about twenty-five per cent. of the original starch in the by-product. This is largely fed to cattle and when dry sells at ten to twelve dollars per ton.

Suggestions for Improving our Public Schools.

A. E. O.

Secure better teachers by more rigid requirements in morals, scholarship and professional training; pay wages that will enable the teacher to come up to the standard required. Especially in the country school, so much depends upon the teacher. Every teacher should be full of energy and enterprise; he needs a heart overflowing with enthusiasm for his work and love for the children entrusted to his charge.

It is the function of the school to prepare the pupils for true and useful lives. To carry this out the teacher must enlist the sympathies of the children, and through them, as far as possible, reach those of the parents. Make the school room and its surroundings as attractive as possible, a place worthy of the children's love and pride.

Celebrate Arbor Day with a suitable programme and have the children plant shade trees. Interest them in having a well-kept walk, and in keeping the school grounds neat and attractive. There is no reason why every school room should not have suitable pictures on its walls, as they can be had so

cheaply. The Perry pictures may be mounted, and add to the attractiveness of any room. Always try to have a few growing plants; the pupils take pleasure in helping to care for them. Have one or two pretty vases to hold flowers carried to school by the pupils. If the teacher is interested enough to speak of the lovely wild flowers the pupils will not be slow to fall in. They will bring grasses, golden rod and autumn leaves during the first months of school. In the spring they will remember Johnny-jump-up, dandelion, pussy willow and sweet apple blossoms. Some time during the term keep patron's day. The pupils should be encouraged to do all their work neatly. Some written work in each branch should be kept by every pupil; this can be neatly copied on clean paper and made into attractive booklets to be shown to parents and friends on visiting day. Often parents know little of what their children are doing in school, and the teacher should try to arouse them and bring them in touch with the work. The children will enjoy writing notes to their parents inviting them to visit the school on some special day. If there is no library in your school, begin one as soon as possible. Have a literary entertainment, charge admission and use the proceeds towards your library. Encourage every child to read; read yourself and talk of what you read. Exert yourself to have an interesting opening exercise each day, so interesting that no one will want to be tardy. Sing, and have your boys and girls to sing. Have them learn our best patriotic songs, so that they can sing them from memory. Have them learn something of the authors and the occasion of the writing of the songs. Have the pupils memorize short quotations and entire poems from the best writers. Pray with your pupils and for them.

Make them familiar with the Bible. Teach them the Lord's Prayer, and selections from the Psalms.

Teacher, you may have pupils who have little help or encouragement at home to become honest and respected men and women. Try to make the influence of the school outweigh the evil influence of environment. Help your pupils to be true to the Divinity that is within them.

Use of Fertilizers.

F. L. W.

One of the most wonderful developments of modern times is the manufacture, sale, and use of commercial fertilizers. Some years ago the farmers of the Central United States ridiculed the idea that their lands would ever need fertilizing, but they have found that even their soils formerly considered inexhaustible are losing their fertility and need help. From the Atlantic to the Pacific we are now seeing an extended use of fertilizers, to supply the exhausted elements, which are necessary to the continued cropping of the soil.

It is to be hoped that growers in these localities will not fall into the error of the southern planter, that is, depending upon the fertilizers merely for an increase in a sale crop, and overlook their real value in the increase of nitrogen-fixing crops, which really increase the fertility of a soil, while at the same time they feed the stock and aid in the making of manure which can be again utilized by application to the land.

In purchasing commercial fertilizers there are many things which are often very misleading. One of the greatest of these is the fact that many different brands of fertilizers on the market are materially the same, differing only in the brand. Each firm manufacturing such goods has its own brand which, according to them, is the very best on the market for the price. The bewildered

farmer is often pestered by the agents of these different firms until he doesn't know which way to turn, and quite often he settles at last upon some brand which has a long chemical analysis, under the name of the brand, not one word of which he understands, and which is intended for a trap for him. My advice to people would be, don't buy by the brand, but make an investigation as to what your soil needs. It may need only a single fertilizing element, or it may need a complete fertilizer. If a grain crop is to be raised by using a short rotation, introducing into it some nitrogen-fixing plant, nitrogen, or as the fertilizing men speak of it, the ammonia, is apt to be found in sufficient quantities. Potash as a single element is less likely to be needed than the other fertilizing elements. In short, what I wish to impress upon your minds is the fact that the different results as published in experiment station records and in various works upon the subject should be more generally consulted and followed, thus annually saving to the American farmer many millions of dollars.

Inoculating Soil for Alfalfa—The True Use of the Legumes.

One of the most interesting facts recently demonstrated is that the so-called burr clover can easily be used to inoculate soil for the growing of alfalfa. This was to be supposed, because they are both members of the same genus, the burr clover being *Medicago Denticulata*, and really a sort of annual alfalfa, for the alfalfa is *Medicago Sativa*. At the Edgecomb, N. C., farm belonging to the North Carolina Board of Agriculture, the burr clover has been found to be one of the most useful winter pasture crops and soil improvers, and while of little value for hay it is the best means that can be used for the inoculation of the soil with the bacteria

that live on alfalfa, for the burr-like seeds carry the bacteria with them and the alfalfa following a crop of the burr clover was found to be well inoculated, and the soil from the burr clover patch has been used to inoculate fresh soil for alfalfa successfully. We do not know how far north the burr clover may be hardy, but it is well worth trying. It succeeds best on a sandy soil, and the seed should be sown among corn or cotton in July or August, and then will give some grazing in the fall. The Monthly Bulletin of the North Carolina Department of Agriculture for July last gives a full account of the experiments that have been made with this plant and with the hairy vetch. This bulletin states that the burr clover succeeds best on the heavier type of sandy soils with a good clay subsoil. When the seed is allowed to ripen the land will be well reseeded for the following fall. The bulletin referred to shows a cut of a cotton crop following burr clover which had been fertilized with 200 pounds of acid phosphate and 80 pounds of kainit per acre. Another cut shows the crop of cotton following cotton with the same fertilizer that was applied to the clover on the other plat, with the addition of 120 pounds of cotton seed meal for nitrogen which the first plat got from the clover. The plat on which the burr clover had been grown made 1,620 pounds of seed cotton per acre, which was exactly 400 pounds more than that made on the plat receiving the complete fertilizer. This 400 pounds of cotton sold for \$18, and deducting picking and excess hauling there was a gain of \$16 in favor of the plat following the clover. This is exactly what we have for years been insisting upon, that we can gain more in the productivity of the soil through the use of the mineral

forms of plant food in phosphoric acid and potash applied to the crop that feeds the soil with nitrogen, than we can by an application of a complete fertilizer to the sale crop. This is not only true in regard to the cotton crop of the South, but is equally true in regard to crops anywhere, and shows that the true use of commercial fertilizers is to increase the growth of the crops that feed the stock and the land at the same time, and to look to them for the sale crops. In short, the true use of fertilizers is not merely to squeeze more sale crops from the land, but to help increase the fertility.—Practical Farmer.

General Agricultural News.

Sir Wm. Macdonald is perfecting his plans for the new agricultural college and experimental farm which, under the supervision of Professor Robertson, late of the Government Experimental Farm at Ottawa, he is to establish at St. Amaede Bellevue, near Montreal.

About 700 acres of land have been secured by the founder, who declares that the college is a personal affair of his own, and that he does not intend to be bound down to any definite sum of money in the completion of his work. The erection of the buildings will be commenced next spring, and the whole cost is expected to be between one and two million dollars.

The institution will be patterned after the agricultural college at Guelph, and the experimental farm at Ottawa.

Some Exotic Shrubs of Promise for Ornamental Planting in the Latitude of Ohio.

In the following review the writer has endeavored to note a few of our exotic shrubs of especial merit, and which may be safely planted in the latitude of Northern Ohio.

Magnolia hypoleuca, sometimes called the silver-leafed magnolia, is a na-

tive of Japan, and is one of the most striking and attractive members of the family. It is a northern species and perfectly hardy as far north as Lake Erie. The leaves are sometimes twenty inches long by seven inches broad, bright green on upper surface and silvery white on the lower. The flowers are from five to seven inches in diameter, with creamy white petals and brilliant scarlet filaments. They are very fragrant and appear after foliage is fully expanded.

Magnolia purpurea, or *soulangeana*, is an importation from China. It also is hardy, forms a low-spreading head, and produces immense blossoms, white, with purple at the base, affording a very attractive combination.

Magnolia stillata. Few small shrubs are more beautiful than this, whether planted singly or in groups of three or four. The plant is hardy and though slow growing, blooms when quite young, and is probably the earliest blooming magnolia. The leaves are from three to five inches long, elliptical in form, and abundant. The flowers are star-shaped, fragrant and of longer continuance than those of most of the species and varieties.

Cornelian cherry (*Cornus masculus*). This earliest of all flowering shrubs is a native of Central Europe. It sometimes attains to a height of fifteen feet with slender branches and well-rounded head. Its chief beauty consists in the small, bright yellow flowers which appear early in spring in advance of the foliage. These blossoms are in compact clusters extending the whole length of the branches, giving the tree a very striking appearance.

Exochorda grandiflora. Pearl bush. This is a hardy shrub of considerable merit when properly grown. It should not be planted alone, but in a border or clump where the somewhat naked ap-

pearance of the stems may be screened by other lower-growing plants. Its beauty consists in the numerous large white flowers in April or May.

Dentzias. There are now several varieties of these well known, hardy and deservedly popular shrubs.

D. candissima pleno, a variety of *D. crenata*, is especially worthy of mention. The white flowers are double and so numerous that the bush in its flowering season has the appearance of a mass of small rosettes.

D. gracilis is one of the smallest members of the family. It usually grows from two to four feet, with numerous slender branches, which combine in the formation of a symmetrical and well-rounded head. The flowers are small, pure white, and produced in the most luxuriant abundance, giving the whole bush much the appearance of a large bouquet. They appear in May or early June. For growing in small gardens or fitting into vacancies among larger specimens these low shrubs serve a most valuable purpose.

Pride of Rochester, an offshoot of *D. crenata flore pleno*, has large double white flowers, some parts of the petals being slightly tinted with scarlet or rose, and it is said to excel all others in size of flower, length of panicle, profuseness of bloom, and vigorous habit. It comes into flower soon after *D. gracilis* and a week or two in advance of most other forms of *dentzia*.

Privets. The privet is an oleaceous shrub of Europe, now naturalized to some extent in the United States, chiefly used as a hedge-plant in both the old and the new worlds. Though it is free from thorns, it makes a close, handsome hedge which bears clipping well. All species grow readily from cuttings.

Chinese Privet (*Ligustrum ibota*). This variety has slender twigs and branches and flowers in drooping grace-

mes, and so fragrant that they perfume the air for a considerable distance. Its conspicuous white flowers show to good advantage. It is notably free from disease and insect enemies, and withstands the smoke and shade of towns and cities. Compared with its near relative, the California privet, growing side by side it withstood the rigorous winter of 1903-'04 uninjured, while the California variety was severely damaged and required cutting back. Considering the ease with which it can be grown and its unsurpassed beauty as an ornamental hedge, the true Chinese privet (*Ligustrum ibota*) merits a hearty reception in this latitude.

Spireas. These belong to the rose family, *Rosaceae*, and are classed among our best known and most popular shrubs.

S. prunifolia flore pleno, the double flowering, plum-leaved spirea, is a shrub of highest value. It grows from six to ten feet high, in bushy form, and with numerous long slender branches. The leaves are lanceolate, small, and numerous, taking on beautiful tints in the autumn. The double white flowers come forth early in spring, covering the whole length of the arching branches.

S. thunbergii is a low, bushy shrub from Japan, and one of the best. It grows three to five feet, with a dense, bushy head and numerous small leaves which in autumn take on beautiful shades of gold, bronze and green. Few plants are more attractive in a border. It is hardy and adapts itself to almost any soil or situation.

S. van honttei is a later introduction from Japan. It is a low spreading bush with curved branches, and is from four to six feet high. Its smooth, trifoliate leaves give it a fine appearance. It bears flowers, white in color, and so profuse as to resemble a huge bouquet.

It is easily cultivated and is being planted extensively in borders, groups and singly.

Hydrangeas. The hydrangeas are among our best ornamental shrubs and are widely distributed. Some are evergreen and some are deciduous, and nearly all are beautiful and interesting.

H. vestita, var. *pubescens*. This is one of the most hardy forms and a native of northern China. The flowers when they first appear are pure white, but later change to rose or pink and hold on until late in autumn. It is pronounced by good authorities the most beautiful of all the hydrangeas that are absolutely hardy as far north as New York and New England, and the earliest to bloom in summer.

H. paniculate grandiflora. This is probably the most hardy of all the hydrangeas known to cultivation. It produces immense heads of sterile flowers which come out in July and continue until frost, being creamy white at the opening and changing to red later on. It may be grown in either tree or shrub form.

Viburnum opulus. This so-called cranberry bush grows from five to ten feet high, and is a vigorous shrub in both its flowers and its fruits. The flowers are white in broad cymes borne on the ends of the branches. The fruit, which is red when ripe, is of a pleasant, acid taste, resembling very closely that of our native cranberry. The fruit hangs on well into the winter, hence the beauty of the bush lasts all year.

V. plicatum is pronounced by good judges the most beautiful and most desirable of all the members of the family. It is of moderate growth and compact habit. The leaves are plicated, of a rich green color, borne on brown shoots, while the flowers are larger and more

solid than those of the common snowball. They hang on the bush and are very showy.

Diervilla Wiegelia—

D. rosea is the best known of several species. It is a native of China. It forms a neat bush, not unlike a *syringa* in habit, and in bloom the beautiful rose-colored flowers hang in graceful clusters from the axils of the leaves and the ends of the branches. It is easily cultivated, growing well in any good soil.

D. variegata, a variety of *D. rosea*, is of smaller size and grows more compactly. The flowers are bright pink and rose, appearing in May or early June. The leaves are beautifully variegated, the margins being creamy-white, and when well grown very attractive. As single well-rounded specimens on the lawn, few plants are more attractive, and it is equally fitted for massing or ornamental hedging. It is hardy, except in the most exposed situations.

C. A. MINER.

University News.

With the football season closed the followers of college sports turn to the winter game of basketball. Already the call for volunteers has been issued, and some twenty to thirty men have answered and are at hard practice under the watchful eye of Coach Sweetland. It is hoped that ere the season is ended Ohio State will be represented in this sport by a strong winning team.

The opening concert of the O. S. U. Glee Club was given on the evening of December 9th in the University Chapel. The concert was a complete success in every respect. All the numbers rendered were excellent, but those of the quartet, consisting of Mytinger ('07), Dickey ('05), Cunningham ('05), and Hare ('05), deserve special mention.

The occasion was one heartily enjoyed by everyone in attendance.

Mr. J. A. Derthick, the new trustee of Ohio State, addressed the Agricultural Society on December 7th, upon the subject, "Agriculture as an Occupation Apart from the Financial Consideration."

The movement on foot to establish a Bible class in the fraternities of the college was permanently organized on Sunday, December 11th. On that day about twenty-five fraternity men met at the Delta Tau Delta house. Neils M. Peterson, Delta Tau Delta, was made permanent chairman, and E. M. Herbert, Beta Theta Pi, secretary. These two, together with J. E. Kewley, Delta Chi, comprise the executive committee to look after the general workings of the organization. The object of the organization is inter-fraternal fellowship and a systematic study of the Bible.

At the meeting of the 'Varsity eleven on December 7th, Ralph Hoyer was elected captain for the season of 1905. Hoyer will be well known to all followers of the college game as the man who has played so consistent a game at center for the past two years. He entered the game two years ago as a Freshman, playing tackle for a time, but soon being changed to center. During this last season he played twenty-one full halves out of the twenty-two. Hoyer is a believer in rigid training in season and this probably accounts for his endurance and his record for the past season.

It was with joy that the students of Ohio State heralded the announcement that the services of Coach Sweetland had been secured by the athletic board as coach and trainer for all the athletic teams representing the University.

This marks a new era in athletics at the institution, and all are filled with great hopes for the future. A trainer the year round had long been the desire of the followers of the Scarlet and Gray, and by this their desires were fulfilled.

Joseph H. Outhwaite has been elected to the position of Dean of the Law Department, to fill the place of the late Dean Hunter. This election further adds to the great efficiency of that department, as he is considered one of the brightest legal minds of the Ohio bar.

The Strollers will make their first appearance of the year on January 6th, presenting Goldsmith's "She Stoops to Conquer." From the past record of the organization the success of the presentation is assured.

Ohio State University has been quite fortunate in securing the registers from the Ohio Building at St. Louis. They constitute six large volumes and contain about 80,000 autographs. They were secured through the efforts of Professors Lazenby and Mills and will be deposited in the Historical Society Library in Page Hall, together with similar books from the Chicago and Buffalo Expositions. These are of little value now, but later will be matters of historic importance.

Professor Orton likewise was successful in securing some ceramic specimens for the museum of that department. He also received assurance that the University would obtain the Japanese ceramic exhibit together with the Ohio exhibit of minerals, embracing the clays, building stone and ores of the state. These various collections make very valuable contributions to the University museums.

Dairy Notes.

A feature of special interest is the fact, that there will be at least one if not two ladies enrolled in the special dairy course at Ohio State during the following winter. This is the first instance of its kind here at the University and opens a new field.

The improvements which they have been making in the dairy laboratories are now taking definite shape, and by the time THE STUDENT reaches its readers operations will have been begun in the newly-equipped laboratories. The brickmasons are almost done and the carpenters are at work finishing the interior.

The refrigerator will be charged with ammonia sometime during the coming week. The large refrigerating apparatus representing a total weight of many tons has been received from the York Company and is being installed. Professor Decker hopes to have the work completed by the last week of December. He has been confronted by many obstacles due to the great weight of the base, and the large fly-wheel, which is six feet and six inches in diameter. When completed the plant will be a very desirable one. The total cost of such a plant is near \$3,000 and will prove quite an addition to the equipment and the effectiveness of the work done in the dairy department.

Johnson and His Old Trusty.

We are confident that our readers all heartily join us in welcoming Incubator Johnson back to our advertising columns for another year. It did not take Johnson long to make his Old Trusty Incubator famous. Our readers will remember that Old Trusty was his new machine that he brought out last year. But Johnson was already well known to poultry raisers in all parts of the country. To many of them personally, to others by his many common sense, helpful articles contributed from time to time to the poultry press. His Old Trusty at this time is almost as well known. This can be attributed to two

causes. First, Johnson's typical western push which makes a success of anything he undertakes, and secondly, the machine itself, Johnson's greatest, the result of his many years experience with poultry and incubator making. The people have been familiarly calling Johnson "the incubator man" for many years. This while he was engaged in building the 50,000 incubators he sold before he perfected his Old Trusty. He is connected with no other incubator or incubator concern now, and no one else has any connection with the Old Trusty or its manufacture. Johnson is standing entirely alone, working hard to make the greatest success of his life of what he considers to be by far his greatest machine. It is worth while for poultry raisers to become acquainted with "the incubator man." It is good to know the plan of his machines and to be familiar with his practical suggestions about the poultry business. His new machines go out on 40 days free trial, and with Johnson's guarantee for five years. We advise our readers to get Johnson's catalog, written by his own hands, in his own peculiar style, with all the enthusiasm of a man who has made a success of poultry raising—a rather remarkable book and full of common sense. Of course, Johnson sends it free. You can write him about any of your poultry troubles and get a personal reply. Look up his advertisement and proceed to get acquainted on the introduction of the publisher.

Book Notice.

THE CEREALS OF AMERICA. By Thomas F. Hunt, M. S. D. Agr., Professor of Agronomy in College of Agriculture, Cornell University.

This is primarily a text-book on agronomy, but is equally useful to the farmer as to the teacher or student. It is written by an author than whom no one is better qualified. The subject matter includes an accurate, comprehensive and succinct treatise of wheat, maize, oats, barley, rye, rice, sorghum, (kafir corn) and buckwheat, as related particularly to American conditions, where germane to the subject, however, results of foreign experience are stated.

The author has made a comprehensive study of the topics treated, drawing freely from the publications of the United States Department of Agriculture, American experiment stations and recognized journals related to agriculture. First-hand knowledge, however, has been the policy of the author in his work, and every crop treated is presented in the light of individual study of the plant. Collateral readings for each crop are also included. Cross references are freely used where thought advisable, and offer excellent opportunity for comparative study of crops. The book is liberally illustrated with 100 entirely new and original drawings by C. W. Furlong and A. K. Dawson.

Handsomely printed from new type, with copious footprints and indices, about 500 pages, large size, 5½x8 inches, substantially bound in cloth. Price, \$1.75, postpaid.

Orange Judd Company, 52 Lafayette Place, New York, N. Y.; Marquette Building, Chicago, Ill.

INCUBATOR

Johnson started his new **Pay-for-itself** hatcher last year and raised a rum-pus with high prices. Don't get fooled. Put your trust in

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On account of bringing the best our trade is increasing so that
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been imported by all others combined.

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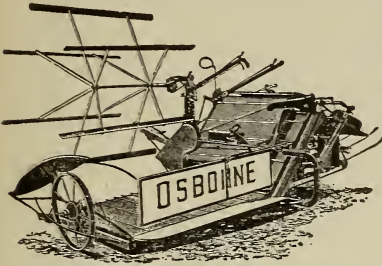
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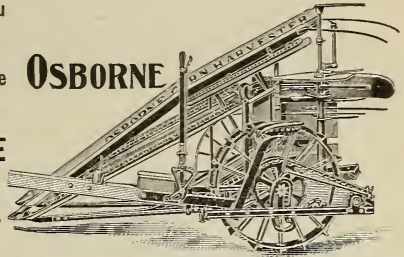
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They'll not take too much, and they'll get it as they want it. Don't force animals to eat salt when they don't require it, by mixing with food.

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are all salt, no impurities. Improve the quality and yield of milk. A modern convenience, always present, animals never neglected, and costs for each only about a nickel a month. See how they enjoy helping themselves when you place it within reach. For all stock. Buy of dealers or send for free booklet to Belmont Stable Supply Co., Brooklyn, N.Y.



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Diseases and health are in direct proportion to pure and foul air.

Animals kept in unsanitary surroundings or in an impure atmosphere never look well, work indifferently require more food for the amount of work expected from them.

There are two kinds of disinfectants for livestock—Chloro-Naphtholeum Dip and all the others.

Not one of the latter is so valuable as Chloro-Naphtholeum Dip.

Chloro-Naphtholeum Dip is a scientific preparation chemically exact—carefully made in our own laboratory by qualified men.

We guarantee it through and through and it will always cure the parasitic skin diseases of

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Avoid the dangerous and poisonous imitations of Chloro-Naphtholeum Dip by getting your supplies from dealer in a sealed, trade-marked can and none other. **One gallon, \$1.50; five gallons, \$6.75—freight prepaid.**

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Gearing all at the top of machine and enclosed in case. Runs with the utmost ease. A speed of 1000 revolutions per minute can easily be reached. Just as accurate results can be obtained as from use of large Turbine machine.

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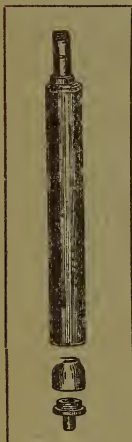
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Dairy Tubular Separator

Tubular quality. **Actual tests** of Tubulars surprise the doubters every time. **Here is a hard test:** On Aug. 2, 1904, we attached a No. 9 Dairy Tubular to a mechanical driving apparatus that turns the machine as a man would. This Tubular was not specially selected, but was taken at random from the many finished Tubulars in our ware house. This Tubular, at date of writing, has been in **constant** operation, every working day, for three and one half months. It has run **fifty hours a week** for fifteen weeks—and is still running. Below we give facts and figures of the test, up to Nov. 15, showing what **wonderful** work this Tubular has done, and how easy it has done it.

A Hard Test



Dairy
Tubular Bowl

Machine under test,	-	-	No. 9 Tubular
Capacity,	-	-	900 lbs. per hour
Hours in operation,	-	-	750
Total time adjusting,	-	-	Not any
Total time oiling,	-	-	Not over three minutes
Total repairs,	-	-	Not any
Total oil used,	-	-	Not over 2 quarts
Revolutions of crank,	-	-	1,972,575
Revolutions of bowl,	-	-	720,000,000
Number pounds separated,	-	-	675,000

675,000 lbs. of milk is about equal to the yield of ten average cows for a period of 11 years, 6 months, and 23 days. The test is **unequalled**. It confirms **all** we claim for the Tubular—is positive guarantee of quality. It shows that Tubulars are capable of doing work equal to at least eleven years service in a ten cow dairy, with no expense for repairs and with the use of not over two quarts of oil. The test still continues. This Tubular will greatly surpass its performance up to the present. At time of writing (Nov. 15) it shows almost no wear. We will keep you informed about the doings of this machine.

Write for Catalogue

The Sharples Co.,
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P. M. Sharples,
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